

REMARKS:

In the foregoing amendments, claim 1 was amended by replacing the term "solid acid catalyst" with "cation exchange resin." Support for this amendment can be found in original claim 2 and Examples 2 and 3 of the present application. Claim 2 was canceled. Accordingly, claims 1 and 3 remain in the application for consideration by the Examiner.

Claims 1-3 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,274,741 of Choudary *et al.* (Choudary ) on pages 2 and 3 of the Office Action. Claims 1 and 2 were rejected under 35 U.S.C. §103(a) as being unpatentable over PCT/US00/30205, which was published as WO 01/32593 A1 of Davis *et al.* (Davis), as evidenced by U.S. Patent No. 2,458,519 of Kosak *et al.* (Kosak) on pages 4-8 of the Office Action. Applicants respectfully submit that the inventions defined in claims 1 and 3 are patently distinguishable from the teachings of Choudary, Davis and/or Kosak within the meaning of 35 U.S.C. §102 or 35 U.S.C. §103 for at least the following reasons.

Initially, it is respectfully noted that while pages 4, 5, and 7 of the Office Action mention U.S. Patent No. 2,458,519 [of Kosak]; Form PTO-892, which was attached to the Office Action, lists U.S. Patent No. 2,458,512 of Hartough *et al.* as a prior art reference. Based on the text of U.S. Patent No. 2,458,519 of Kosak that was cited or quoted in the Office Action, it appears that the Examiner intended to rely on these teachings in the §103 rejection. It is respectfully requested that the Examiner explicitly correct the references on which the §103 rejection is based in the next Official communication and provide an additional Form PTO-892, which lists U.S. Patent No. 2,458,519 of Kosak.

Present claims 1 and 3 define, *inter alia*, a process for the preparation of a 2-acylthiophene compound which comprises reacting a thiophene of formula (1) with acid

anhydrides represented by formula (2) or acid halides represented by formula (3) in the presence of a *cation exchange resin* at a temperature less than 75°C in the absence of solvent, thus producing a 2-acylthiophene compound represented by formula (4). The teachings of Choudary, Davis, and/or Kosak do not contemplate or suggest the process required in claims 1 and 3.

For example, the teachings of Choudary propose a process for the preparation of an acyl heteroaromatic compound comprising, *inter alia*, reacting a thiophene with C<sub>2</sub>-C<sub>5</sub> acid hydride employing clays (i.e., clay catalyst) (Abstract; col. 4, ll. 2-5 & 20-36). However, Choudary nowhere contemplates or suggests the use of a cation exchange resin, as required in the present claims.

The teachings of Davis are further removed from the presently claimed invention than the teachings of Choudary. The Office Action alleges that Davis discloses acylation of aromatic heterocyclic compounds (including thiophene) using an acylation agent that is selected from the group consisting of the halides of aliphatic carboxylic acids and the anhydride of carboxylic acids in the presence of zeolites. The use of zeolites as proposed by Davis cannot remotely contemplate or suggest the cation exchange resin as required in the present claims.

The teachings of Kosak propose acylating thiophene with silica-alumina catalyst. The silica-alumina catalyst required by Kosak is different from and cannot suggest the cation exchange resin as required in the present claims.

In summary, none of the teachings cited against the present claims (i.e., Choudary, Davis, and/or Kosak) contemplate or suggest the preparation of a 2-acylthiophene compound by reacting a thiophene compound with an acid anhydride or acid halide in the presence of a *cation exchange resin*, as required in present claims 1 and 3. Accordingly, the Office Action fails to establish a factual basis (namely, the use of a cation exchange resin in the process of present

claims 1 and 3) to support the legal conclusion of obviousness for these claims. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). For this reason alone, applicants respectfully submit that the presently claimed invention is patently distinguishable from the teachings of Choudary, Davis, and/or Kosak.

In addition, applicants respectfully submit that the data in the present specification disclosure demonstrates the unexpected advantages of the presently claimed invention. Excerpts of the data from Examples 1-8 of the present application are shown in the following table:

Example	Catalyst	Yield (%)
1	Activated clay	65
2	<b>Cation exchange resin</b>	77
3	<b>Cation exchange resin</b>	84
4	Zeolite	62
5	Activated clay	58
6	Activated clay	55
7	Activated clay	67
8	Activated clay	52

The foregoing data demonstrates the unexpected advantages of using a cation exchange resin in place of another solid acid catalyst, such as activated clay or zeolite. For example, in Examples 1 and 4-8, where a cation exchange resin was not used (namely, an activated clay or zeolite was used) as a solid acid catalyst, the yield of 2-acylthiophene was 65%, 62%, 58%, 55%, 67%, and 52% respectively. On the other hand, in Examples 2 and 3, where a cation exchange resin was used as a solid acid catalyst, the yield of 2-acylthiophene was 77% and 84% respectively. The high yields of 2-acylthiophene (77% and 84%) in Examples 2 and 3 are unexpectedly superior to and surprising over the lower yields of 65%, 62%, 58%, 55%, 67%, and 52% in Examples 1 and 4-8 respectively. Applicants respectfully submit that this data demonstrates the unexpected advantages and patentability of the inventions defined in claims 1 and 3.

For at least the foregoing reasons, applicants respectfully submit that the inventions defined in claims 1 and 3 are not contemplated or suggested by, and thus are patently distinguishable from, the teachings of Choudary, Davis and/or Kosak. Accordingly, applicants respectfully request that the Examiner reconsider and withdraw all the rejections under 35 U.S.C. §102 or 35 U.S.C. §103 that were set forth in the outstanding Office Action.

Based on the foregoing amendments and remarks, favorable consideration and allowance of claims 1 and 3 are respectfully requested. The foregoing is believed to be a complete and proper response to the Office Action mailed January 7, 2009.

In the event that this paper is not timely filed, applicants hereby petition for an appropriate extension of time. The Commissioner is hereby authorized to charge the fee therefor, as well as any deficiency in the payment of the required fee(s) or credit any overpayment, to our deposit account No. 50-1147.

Respectfully submitted,  
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